

REMARKS

Claims 1-12 and 14-22 are pending in the application. Claims 6-12 and 17-22 are withdrawn. Claim 1 is currently amended. Claim 13 is cancelled. Applicant respectfully requests for allowance of claims 1-5 and 14-16 based on following discussions.

Rejections under 35 USC 103

Claims 1-5, and 13-16 are rejected under 35 USC 103(a) as being unpatentable over US Patent No. 6,142,163 to McMillin et al. (hereinafter referred to as “McMillin”) in view of US Patent No. 5,944,049 to Beyer et al. (hereinafter referred to as “Beyer”).

Independent claim 1, as amended, is directed to a method of setting the pressure in a chamber of a vacuum system to a required pressure, the system comprising a pressure control system including a pump for evacuating gas from the chamber, a valve down stream of the pump, and a flow controller for allowing the flow of gas into the chamber, the method comprising: setting an initial flow out of the chamber for achieving a pressure above the required pressure so as to increase a rate of pressure increase, the initial flow occurring over a transient period which does not allow the pressure to exceed the required pressure, and setting a preset flow out of the chamber after the transient period has elapsed for achieving and maintaining the required pressure, wherein the setting comprises varying a conductance of the valve down stream of the pump, wherein the chamber is specifically used in flat panel display processes, wherein during the transient period, the pump speed is reduced so that the amount of gas which leaks upstream across the pump increases so as to increase the gas flowing into the chamber. It is noted that the underlined portion of the claim language is currently added by amendment.

A. *McMillin teaches away from “during the transient period, the pump speed is reduced so that the amount of gas which leaks up-stream across the pump increases so as to increase the gas flowing into the chamber.”*

Applicant respectfully submits that McMillin does not teach “during the transient period, the pump speed is reduced so that the amount of gas which leaks up-stream across the pump increases so as to increase the gas flowing into the chamber.” McMillin teaches a method that uses a ballast port for injecting gas into an evacuation pump in order to control the pressure in a reaction chamber. *See, abstract*. It teaches away from a method that increases the pressure in the reaction chamber during the transient period by reducing the pump speed, thereby increasing the amount of gas which leaks up-stream across the pump. One of the objectives of McMillin is to minimize the amount of particulate waste material introduced into the reaction chamber. *See, col. 2, lines 59-64*. Reducing the pump speed during the transient period would cause an up-stream gas leakage, thereby potentially leading to a greater chance of chamber contamination. A prima facie case of obviousness may be rebutted by showing that the art, in any material respect, teaches away from the claimed invention. *In re Geisler, 116 F.3d 1465 (Fed. Cir. 1997)*. McMillin teaches away from reducing the pump speed during the transient period in order to quickly ramp up the pressure in the reaction chamber.

B. *It would not have been obvious for a person skilled in the art to modify McMillin in view of Beyer by replacing McMillin’s blast gas injection method with Beyer’s pump speed adjustment technique.*

Applicant acknowledges that when the pump speed is reduced, it is inherent that the possibility of up-stream gas leakage would increase. However, Applicant respectfully submits that McMillin does not teach specifically to increase the pressure of the reaction chamber by reducing the pump speed during the **transient period**. McMillin teaches using blast gas injection to manipulate the chamber pressure during the transient period, but it fails to teach, suggest, or motivate an alternative solution based on pump speed reduction.

Applicant respectfully submits that Beyer does not teach “during the transient period, the pump speed is reduced so that the amount of gas which leaks up-stream across the pump increases so as to increase the gas flowing into the chamber”, either. Although Beyer teaches various method of manipulating gas flows in a vacuum pump system, it does not teach a transient period during which the initial pressure setting in the reaction chamber is adjusted to a higher level than that of a normal, steady state.

It would not have been obvious at the time of the invention for a person skilled in the art to modify McMillin by replacing its blast gas injection method with Beyer’s pump speed adjustment technique. If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984). As discussed above, modifying McMillin by replacing its blast gas injection method with Beyer’s pump speed adjustment technique would increase the chance of chamber contamination, thereby rendering its intended objective unsatisfactory. Thus, as a matter of law, there is no suggestion or motivation to make the proposed modification. The mere fact that references can be combined or modified does

not render that resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990). As discussed, there is no suggestion to combine McMillin and Beyer, or modify McMillin in view of Beyer. Thus, the claim limitation “during the transient period, the pump speed is reduced so that the amount of gas which leaks up-stream across the pump increases so as to increase the gas flowing into the chamber” is not obvious over McMillin in view of Beyer.

C. The claimed invention is specifically applied in flat panel display processes, whereas McMillin does not.

The claimed invention is specifically applied in flat panel display processes where large chambers are used, and therefore the need for reducing pump-up time is significant and the use of pump speed reduction to shorten the pump-up time is suitable. Unlike the claimed invention, McMillin is directed to general semiconductor processes, such as wafer plasma etching. *See, col. 1, lines 14-27*. Typically, general semiconductor processes use much smaller chambers and require much smaller gas flows than the flat panel processes do. As a result, a quick blast of gas injection may ramp up the gas pressure of a semiconductor process chamber quickly, but not so much for a flat panel display chamber.

Thus, Applicant respectfully submits that claim 1 is patentable over McMillin in view of Beyer under 35 USC 103(a). Accordingly, claims 2-5, and 14-16 that depend from claim 1 and include all the limitations recited therein are also patentable over the cited references under 35 USC 103(a). It is noted that claim 13 has been cancelled.

CONCLUSION

Applicant has made an earnest attempt to place this application in an allowable form. In view of the foregoing remarks, it is respectfully submitted that the pending claims are drawn to a novel subject matter, patentably distinguishable over the prior art of record. Examiner is therefore, respectfully requested to reconsider and withdraw the outstanding rejections.

Should Examiner deem that any further clarification is desirable, Examiner is invited to telephone the undersigned at the below listed telephone number.

Applicant does not believe that any additional fee is due, but as a precaution, the Commissioner is hereby authorized to charge any additional, necessary fee to deposit account number 50-4244.

Respectfully submitted,

By: /Ting-Mao Chao, Reg. No. 60,126/
Ting-Mao Chao
Attorney for Applicant
Registration No. 60,126

Edwards Vacuum, Inc.
Legal Service – Intellectual Property
2041 Mission College Blvd. Suite 260
Santa Clara, CA 95054

TEL: 1-408-496-1177 ext. 2222
FAX: 1-408-496-1188

Customer No.: 71134